MARINE REVIEW.

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The Steamship S. S. Curry.

S. S. Curry is the name selected for the steel steamer to be launched from the yard of F. W. Wheeler & Co., West Bay City, Mich., on Tuesday next, for the Hawgood and Avery Transit Company of Cleveland. The name is taken in honor ot Capt. S. S. Curry, president of the Metropolitan Iron and Land Company, and the leading spirit in the management of the Norrie mine, owned by that company. The mine is the largest iron ore producing property in the world, and the steamer, which is to engage mainly in the ore trade, is by great odds the largest vessel as yet built on the lakes. Capt. Curry, who will have an interest in this steamer, is not as well known among vessel owners as he is to the owners and managers of iron mines in the Lake Superior region. He was among the early prospectors on the Michigan iron ranges, when the Lake Superior country was little better than a wilderness, and had earned the success that came to him in the big Norrie mine upon the discovery of the Gogebic range. Under his management, the Norrie group, including the Pabst, controlled by the same company, has produced, in the eight years since shipments were begun in 1885, 4,716,108 gross tons of ore, the output reaching 1,078,788 tons in 1890 and 1,098,461 tons in 1892.

CAPT. S. S. CURRY.

The steamer is of the same dimensions as Wheeler & Co.'s Centurion, upon which construction was begun last month and for which a syndicate of owners, headed by Mark Hopkins of St. Clair, Mich., and Capt. John Mitchell of Cleveland, have agreed to pay $265,000. Neither owners nor builders are making any predictions as to the carrying capacity of this very big vessel, but it is probable that on a Sault canal draft of 14 feet 6 inches she will carry from Lake Superior, where all large craft are limited in cargo, 3,400 gross tons, and that if given 17 feet of water, as was the case with the Maritana last season, when that boat took 4,771 net tons from Escanaba to South Chicago, she would move 5,000 net tons without difficulty. A most important feature in her construction, aside from the location of engines in the center, is the extent of water ballast capacity, through which it is probable that the vessel when running without cargo may be made to draw 9 feet forward and 15 feet aft.

The principal dimension of the S. S. Curry are: Length over all, 378 feet 6 inches; length of keel, 360 feet; breadth, extreme, 45 feet 2⅜ inches; breadth, moulded, 45 feet; depth, moulded, 26 feet. For water ballast she has a cellular double bottom differing from the ordinary floor system employed in lake practice. The bottom extends fore and aft, and is 54 inches deep, with a capacity of 1,600 tons. The sheer strake is extra heavy, and doubled for the entire length of the vessel. Web frames are spaced 16 feet apart throughout the vessel, extending to the spar deck, and the deck beams are supported by three tiers of extra heavy I stanchions. This and other features of construction in the ship are in accordance with the rules of the American Ship Masters' Association. The American Ship Windlass Company, Providence, R.I., furnished the Providence steam windlass and capstan.

Steam at 170 pounds pressure will be furnished by three cylindrical boilers 12 feet 6 inches diameter, and 12 feet 8 inches long. Each boiler has three 40-inch diameter furnaces, the total grate surface being 100 square feet, and the heating surface 6,500 square feet. The motive power will consist of triple expansion engines, built in F. W. Wheeler & Co.'s shops, with cylinders 23, 37½ and 63 inches, by 44 inches stroke. The valves are actuated by the ordinary Stephenson link motion. The high pressure and intermediate pressure cylinders have each a piston valve, and the low pressure cylinder has a double-ported balanced slide valve. The links are of the double barred type, and the motion is reversed by steam, the diameter of reversing cylinder being 12 inches. The bed plate is cast in one piace, and the frame work consists of three straight cast iron columns on the starboard side, and three Y-shaped columns on the port side, having very large bearing surfaces for the slides, and through bolts are used throughout.

The departure from lake practice in placing the engines amidships will be watched with interest, as regards effect on cargo space and other results. The ease with which she will be handled in harbors will also be considered by vessel owners.

Lake Freight Situation.

The corner in wheat and the steadfast refusal of the leading steel makers to buy iron ore at prices that will be considered by the mining companies have combined to cause a discouraging opening in lake freights. Certainty of a heavy movement of freight of all kinds still prompts vessels owners to refuse low rates on ore contracts, although the opening wild rates have declined to 1½ cents on wheat from Chicago and 2¾ cents from Duluth to Buffalo. It is probable that no ore will be loaded at Escanaba May 1, and even a single trip rate from that port has not as yet been established, on account of the peculiar conditions ruling in the sales market. The rate paid on 200,000 tons of Escanaba ore taken by the Milwaukee Tug Boat Company is 85 cents. Coal freights are active and unchanged, but there are some fears of a strike in Ohio and Pennsylvania on May 1.

Buffalo Port Matters.

Special Correspondence to the MARINE REVIEW.

BUFFALO, N. Y., April 20.—The financial embarrassment of A. G Yates of Rochester discloses a most extraordinory state of things. Yates was president of dozens of concerns, from the Buffalo, Rochester & Pittsburg Railroad to about every coal receiving concern in the west, including the Lehigh & Franklin in Chicago, Lehigh Coal and Iron Company at West Superior, Dominion Coal, Coke and Transportation Company, with headquarters at Winnipeg and marine docks in Port Arthur, and he had coal dock interests in Milwaukee. Since the failure of the Hatfield Company in Milwaukee there has not been such a crash in the water coal trade. Hard coal shippers here used to give him full swing on Lake Ontario, but they placed him under contract not to ship from Charlotte through the Welland. His restless activity was such, however, that even then he was always suspected of sending coal to the upper lakes and everybody was watching him. The extent of the embarrassment or its effect on the trade is not yet known.

There is going to be a new deal all round in the movement of grain eastward from here. The canal forwarders failed to come to an understanding and are prepared to cut each other to pieces, as usual, with no company elevator here or agent in the west to help them out, but circumstances promise to help them out. It looks as though there would be five elevators out of the pool, and as three of them are owned by boat owners they can be depended on to cut rates. The roads are very tired of slashing each other and have agreed to take all grain through a joint agent in New York, who parcels it out according to an agreed proportion. If this works there is an end of carrying at a loss and the canal can live. At any rate, some new light is going to be thrown on the business.

Here are some opening dates: First departure from Buffalo, Fay and tow, light for Cleveland, April 15; first cargo, same day, Maytham with coal for Toledo; first corgo for the upper lakes, Aurora, on the 16th, with coal for Chicago; first arrival at this port, St. Paul and consort Scotia with wheat from Toledo. Every marine man knows just when navigation is to open. This year the predictions were fully two weeks off, and consequently vessels here are not fitted out and will hardly get away before the harbor is full of the Chicago grain fleet.

The old dispute between the government engineer and the tugmen is coming up again. One side declares that there is at least 14 feet of water to Tonawanda, and the others are bound that it is not safe to risk much over 12 feet. There is going to be a demand for deeper water in the Niagara this season for vessels of deeper draft than usual are chartered to carry lumber to Tonawanda. The dangerous passage is just above the International bridge, which is not only vexed by a nine-mile current, but has a bottom covered with ugly bowlders, which from their nature and position are very hard to remove.

The U. S S. Michigan, much to the sorrow of society in Erie, has successfully passed the winter here and is now equipped with new boilers and getting ready for her season. She is out of drydock and ought to be under way soon. As dignified convoy to the world's fair she will come just in play, for she has been painted white, and if some plan could be devised to give her prow a heavy sheer forward as it comes down to the water she would be a good counterpart of the smaller members of the famous white squadron.

The Frontier Iron Works of Detroit as sub-contractor for the boilers of the propeller Sitka is making a long trial of its suit against Riter Bros. here, who built the boilers. They were not long after the vessel was built thrown out as faulty, but the builders refused to make them good. The suit has been in progress here several days.

Canadian Shipping Matters.

Special Correspondence to the MARINE REVIEW.

KINGSTON, Ont., April 19.—The steamers of the Thousand Island and St. Lawrence River Steamboat Companies (the Folger lines) have been put in thorough order for the summer trade. Capt. Milo D. Estes, who commanded the steamer St. Lawrence, the river greyhound, for nine seasons has retired and is succeeded by Capt. C. W. Rees of Clayton, N. Y. The old Sylvan Stream is now a new craft to all intents and purposes. She has been thoroughly refitted and refurnished and will pass under the name of the Empire State, a compliment to New York, the state in which she is registered. It is expected she will run 17 or 18 miles an hour. She will have plate glass throughout, and beveled mirrors in every panel of her cabins. Her seats will be of the Wagner sleeping car type, answering the double purpose of seat and bed. Capt. Andrew Miller will be in charge of this vessel with James Gillie as engineer. The other crafts will be thus officered: Steamer Islander, Capt. A. Charlevois; steamer Maud, Capt. C. Hinckley; steamer Pierrepont, Capt. James Allen.

The Collingwood Dry Dock and Wrecking Company has launched a new tug to be called D'Alton McCarthy. The tug measures 80 feet over all, 15 feet beam, and has a fore and aft compound engine and a 50 horse power Gibbon boiler. She is also fitted with an electric light plant and all modern machinery. She will be a very useful craft on the Georgian Bay.

The new steamer James Swift, built by Davis & Sons of Kingston, and named after the well known Kingston forwarder, has been launched. She is elegantly fitted, being lighted throughout by electricity and heated by steam, having a large dining room on the main deck, the promenade deck being occupied by state rooms and a spacious saloon. Her machinary is of the steeple compound type, 9x16x12, which will be worked by an independent air pump, and a boiler capable of supplying steam at 125 pounds pressure. The new boat will make 11 miles per hour, and will run between Kingston and Ottawa in place of the Rideau Belle.

The Ottawa Transportation Company has changed the names of several of its barges, because of the similarity of names of other crafts. The changes are: Zaida D. Eddy to Davidson, John McLaurin to Neville, McKenzie to Clark, D. Richard to Wood, Arthur E. Sixsmith to Grant.

The water in Lake Ontario is higher than hitherto. At Toronto there has been such an increase of water that vessels can load lumber at the docks.

Inventions of a Marine Nature.

Specially reported from Washington for the MARINE REVIEW.

495,040—Machine for handling and loading coal, etc., by George H. Hulett of Cleveland, O; filed Nov. 25, 1892; serial number 453,009. The bucket or hod is attached by two arms to the crane boom and the arms pivoted to the same; a rope and sheave connect the bucket to its counterweight, and power is obtained by other ropes and sheaves.

495,410—Steamboat by William Grosse of Little Suamico, Wis.; filed Sept. 1, 1892; serial number 444,761. A boat with a false keel, a vertical adjustable frame piece and a main shaft on fixed bearings in the boat; a propeller shaft borne in universal bearings on the main shaft, and in the frame piece, the latter having means to permit of a longitudinal motion in the propeller shaft.

495,047—Electrical indicators for rudders by Charles V. Knowles of Summerville, N. J.; filed Feb. 16, 1892; serial number 421,679.

Copies of patents can be had from the MARINE REVIEW, No. 516 Perry-Payne building, Cleveland, O., at the uniform rate of 15 cents each.

Appointments of Masters and Engineers.

Hebard, Chas. & Son, Pequaming, Mich.: Steamer—Charles Hebard, Capt. Jas. Parsons, Engineer Wm. Schumacher. Schooners—Aloha, Capt. Wm. Elliott; Annabell Wilson, Capt. Dan'l Nathan; Annie M. Peterson, Capt. Chas. Bough; Ben Brink, Capt. Ole Gunderson. Tugs—Dan'l L. Hebard, Capt. Hugh McKenzie, Engineer Jos. Greenleaf; Jay C. Morse, Capt. Frederick C. Rogers, Engineer Chas. Fisher. Yacht—Allenton, Capt. John P. Richards.

American Steel Barge Company, West Superior, Wis.: Steamers—Colgate Hoyt, Capt. W. H. Kilby, Engineer Newton; A. D. Thomson, Capt. George Holdridge, Engineer Sampson; E. B. Bartlett, Capt. Gus. Atkinson, Engineer Edgar; Thos. Wilson, Capt. A. P. Chambers, Engineer Blauvelt; Sam'l Mather, Capt. Jno. Smith, Engineer Marshall; Jas. B. Colgate, Capt. Robert Smith, Engineer Cornell. Barges—101, Capt. Geo. Gallant; 102, Capt. Ed. Peabody; 103, Capt. Thos. J. Emory; 104, Capt. Wm. Griffin; 105, Capt. Jas. Burr; 107, Capt. W. C. Butts; 109, Capt. John Gillis; 111, Capt. M. H. Boyce; 115, Capt. Jas. Boyd; 116, Capt. A. McEachren; 117, Capt. William Holdridge; 118, Capt. A. G. McLeod; 126, Capt. Thos. J. Brady; 127, Capt. A. R. Robinson; 129, Capt. E. Emanuelson; 130, Capt. W. S. Hoag; 131, Capt. Jos. Leahy; 132, Capt. A. R. Jones; 133, Capt. F. A. Barker; 134, Capt. H. P. Jamison.

Smith-Fee Company, Duluth, Minn.: Steamers—Ossifrage, Capt. Fred. Herbert, Engineer S. R. Morrison; S. B. Barker, Capt. E. C. Smith, Engineer Conrad Sullivan. Tugs—A. C. Adams, Capt. Ed. Brown, Engineer A. Wagner; Pathfinder, Capt. Louis La Chapelle, Engineer James Mutch; Fiske, Capt. C. H. Green, Engineer Albert Baker; J. W. Eviston, Capt. W. H. Smith, Engineer Thomas Jones.

Official Numbers and Tonnage.

The bureau of navigation, E. C. O'Brien commissioner, assigned official numbers and tonnage to the following lake vessels during the week ending April 15: Steam—Yuma, Cleveland, 4,042.43 tons gross, 2,690.03 net, No. 27,655; Ellen, Milwaukee, 349.95 tons gross, 194.83 net, No. 136,358; E. G. Maxwell, Grand Haven, Mich., 88.41 tons gross, 56.25 net, No. 136,357; Arthur Jones, Grand Haven, 34.42 tons gross, 20.09 net; Odd Fellow, Grand Haven, 22.50 gross tons, 13.95 net, No. 155,238. Sail and unrigged—Mary E. McLachlan, Port Huron, Mich., 1,394.37 tons gross, 1,324.75 net, No. 92,503; No. 129, Buffalo, 1,310.82 tons gross, 1,265.92 net, No. 53,276; No. 130, Buffalo, 1,310.82 tons gross, 1;265.92 net.

Reward for Locating a Sunken Tug.

L. P. & J. A. Smith of Cleveland, whose tug Amadeus was lost near the "Dummy," Lake Erie, last fall, authorize the REVIEW to announce that they will pay $500 to any one who will locate the sunken boat. All information obtained by the owners after the accident can be had upon application to them. J. and T. Conlon of Thorold, Ont., lost a large dredge last season off Pelee point, which is in the vicinity of the "Dummy," and Albert Grub, who lives on the point and claims to have since located the dredge, wants $1,500 for the information which he holds.

Shipbuilding Here and Abroad.

(By Naval Constructor Philip Hichborn, U. S. N., in North American Review.)

As naval shipbuilding is the highest grade of ship construction, it follows that when occasion demands we shall be able to turn out duplicates of and improvements upon such ships as the New York, Furst Bismarck, Touraine and Teutonic. The building of large ocean steamers presents less difficulties than that of ships-of-war of modern size. In the large ocean steamer everything is sacrificed for speed, and length, width and depth are allotted without stint. In a ship of 500 to 600 or more feet it is upon the marine engineer mainly that everything depends, and it would be passing strange if our talent in that line could not reproduce and improve upon the splendid engines in our new navy where the designer was cramped for room. Until the American flag was hoisted on the New York, on Feb. 22, there were no fast transatlantic steamers flying the stars and stripes. We have had, however, home built steamships plying on the Pacific, south Atlantic and to the West Indies, not to omit the coasting and lake steamers, that are as fast, as commodious, and as safe as similar vessels (if such exist) abroad. The old City of Peking, built in 1874, is a better and more profitable steamer than the China, built in Glasgow in 1889, and placed on the same route as the City of Peking. The following comparative data may be of interest :

DATA.	City of Peking.	China.
Built	1874	1889
Gross tons	5,079	5,480
Cargo capacity	4,000	3,600
Length over all, feet	423	466
Maximum speed	15	17
Coal, tons per day, at 11 knots	47	61
" " " 12 "	56	68
" " " 13 "	68	81
" " " 14 "	.....	100
" " " 15 "	.....	125

It will be noted that the coal consumption, so important a factor in successful steamship running, is decidedly in favor of the City of Peking. Taking a few instances of well-known American built steamers, we find the Louisiana, of 2,840 tons, consuming only 34 tons, at a speed of 14¾ knots; the Mariposa, 3,158 tons, burning 50 tons to make 14½ knots, and the San Pablo, 3,119 tons, requiring only 35 tons at 13 knots, and 40 tons to make 14 knots. Then there is the Australia, 2,730 tons, a British steamer, chartered for the San Francisco and Melbourne route, originally fitted with compound engines, and with a consumption of 53 tons of coal making only 12 knots. In 1889 her engines and boilers were removed, and new triple expansion engines and boilers carrying 160 pounds were built in San Francisco and put in the ship. With this new machinery she is making 14 knots on an expenditure of only 37 tons. From these examples it would appear as if American marine engine-builders have a considerable share of the knowledge of which Scotch builders claim a monopoly ; while the performance of the City of Peking would indicate that our marine engineers know more of the economics of steamship performance than Clyde builders.

It is stated that no less than four steamers, duplicates of and possibly improvement upon the Paris, are to be built at Cramp's yard. The question of ability to build ships in this country is no longer to be mentioned in discussing the subject. It is simply a question of dollars and sentiment, and there seem to be men willing to make a practical demonstration of their patriotism and take the chances of American transatlantic travellers patronizing an American steamship line. To reproduce a new Paris in a shipyard on this side will require an advanced cost of about 20 per cent. upon $1,600,000, the reported cost of that steamer, which was built in Scotland. In a table in the next column the reported cost of some well-known transatlantic steamers is given together with such data as will faciliate computation of cost of similar ships built in this country.

The cost of mild steel for shipbuilding purposes has been greatly reduced in this country during the past few years. From 6 cents per pound in 1885 it has fallen to 2 cents at the present time, while in Scotland the cost has also decreased in the same period from 2½ cents to 1⅓ cents. Thus the American ship builder has to pay 50 per cent. more for his steel than his competitor on the Clyde. The American workmen receive in Cramp's yard about 80 per cent. higher wages than were paid to the workmen that built the Paris.

It may therefore be accepted as a fact that in high-class work the ship builder in this country requires 20 per cent. more pay, but when it comes to what may be termed second and third class steamers, the Americans are "not in it" at all, and for very good reasons. Competition has greatly reduced the price of steamers in Scotland and the requirements of trade have demanded, or rather made it possible to introduce, a class of steam vessels known as "tramps." In 1881 the price of transatlantic steamers

STEAMERS BUILT IN GREAT BRITAIN AND GERMANY.

Name.	Built.	Iron or steel.	Gross tons.	Horse Power	Speed.	Total cost dollars.	Cost per gross ton	Builders.
Britannic	1874	I	5,004	5,400	16.08	925,000	$185	Belfast.
Arizona	1879	I	5,164	6,357	17.	825,000	160	Glasgow.
Orient	"	I	5,365	5,595	14.	750,000	140	"
Alaska	1881	I	6,932	10,000	17.87	1,200,000	173	"
Servia	"	S	7,392	10,350	16.75	1,327,000	179	"
Oregon	1883	S	7,375	13,300	18.75	1,680,000	228	"
Aurania	"	S	7,269	8,500	16.85	1,380,000	190	Clydebank
America	1884	S	5,528	7,354	18.71	975,009	176	"
Etruria	"	S	8,120	14,321	18.80	1,695,000	209	"
City of Paris	1888	S	10,499	21,000	20.76	1,600,000	152	"
Augusta Victoria	1889	S	7,641	14,110	18.31	*878,715	*115	Stettin.
Teutonic	"	S	9,686	18,000	20.18	1,954,000	203	Belfast.
Furst Bismarck	1890	S	8,716	16,000	19.86	*1,200,000	*115	Settin.
Normannia	"	S	8,250	15,000	19.20	*948,750	*115	Glasgow.

*Indicates cost of hull and machinery only; all others complete and ready for sea.

was quoted at £22 per gross ton for one of 2,000 gross tons, with cabin accommodations and 13 knots speed. In 1891 the price had fallen to about £15 per gross ton. In 1884 the following prices were quoted :

1st class transatlantic steamers	£28 5s.	Over 4,000 gross tons.
2nd " " "	£22 17s.	
Cargo	£20 10s.	

In 1891 the price of first-class transatlantic steamers was £21 to £23. At the present time a well built British steamer of 1,620 gross tons for cargo carrying will cost £14 10s., and "tramp" steamers, such as are now competing with American-built steamers on the Brazilian steamship line, can be had for £10 per gross ton. There are no builders of "tramps" in this country, nor is there any demand for such ships. While it must be admitted that the extra cost of 20 to 40 per cent. on a steamer, according to her quality, is a serious drawback to shipbuilding, the disadvantage does not terminate with the completion of the ship. The ship-owner in America starts in with 20 to 40 per cent. extra cost and the federal and state laws immediately cripple his opportunity for successful competition with the cheap ship owner. Thus an American ship is taxed in its home port the same as any other property, while in England, for example, only the net profits on the vessel are taxed. It costs practically as much to build in France and Italy as it does in England, and the margin is not very great between the United States and Great Britain. The enormous difference existing between the wages of the several countries would naturally lead a person to different conclusions, but the proofs to the contrary are indisputable and not to be controverted. It is because the American workman must live differently to the European workman that he requires and receives better pay, but the return is made in intelligent and conscientious work, and the proof of it is shown in the cost of our navy ships. Thus, while an American-built ship does cost more than a similar foreign vessel, it is equally true, too, that the sailing of ships under the American flag entails increased expenditures. Take, for example, the actual running expenses of the following representative sailing vessels of 850 tons register :

	American.	British.	French.	German.
Wages	$574.00	$350.25	$315.00	$325.75
Victualing	300.00	250.00	225.00	180.00
Total cost one month,	$874.00	$600.25	$540.00	$505.75

To compete successfully against such odds is out of the question. American ship-builders are not permitted, nor would they be allowed, to put afloat such craft as are doing business under foreign flags, and our ship owner can not run an expensive ship with a well-paid and well-fed crew, against a cheap foreign ship with a cheap and badly-fed complement. It is clear that even if a ship-owner could purchase a steamer abroad at a cost much less than it would cost here, the running expenses would ultimately embarrass him. Therefore, in order to make shipping profitable, the national and state governments should encourage rather than discourage ship-owning. It would not have paid to start many branches of industry in this country had not the government aided them by protection, and that is just what our shipping needs—liberal subsidies to make the American dollar go as far on the ocean highway as the English crown and the Prussian thaler.

Exhibits of Interest in Shipping Lines.

In addition to the displays to be made at the World's Columbian Exposition by foreign and American steamship companies and shipbuilders, reference to which has been made in recent issues of the REVIEW, there will be exhibits from kindred interests that will be of direct importance to visitors from lake cities. Aside from its grand mineral display, the state of Michigan has an outdoor space where a genuine logging camp, 70 feet long and 20 feet wide, is being constructed. It will be an exact reproduction of the camps Michigan lumbermen live in, and the daily bill of fare will be the same as they have in the woods. Besides the camp there will be in this show the largest load of logs ever put on a sleigh and drawn by a single span of horses. These logs were cut and sent by Nester Bros., of Baraga. The load consisted of fifty pine logs, each 18 feet in length. The biggest log contained 1225 feet, board measure, and the smallest 404 feet, and the whole weighed 300,000 pounds, or 150 tons. It took a ton of chain to bind the load together. It took ten standard size flat cars to transport the load to Chicago. Near the camp will be a log train of five cars, and all about the place specimens of the tools used from the opening of the first camp up to the present time.

Messrs. Simons & Co., of Renfrew, England, a firm which has, for over a quarter of a century, made the manufacture of dredging vessels a specialty, and has built about 200 craft of this kind, will have an elaborate exhibit, including six models representing entirely different types of vessels in use in different parts of the world. One of these, the Melbourne, is fitted with an endless chain of steel buckets, some 36 in number, each of which has a capacity for 22 cubic feet of mud, and each alone weighs 2½ tons. These are capable of raising 1,000 tons of sand an hour from a depth of 37 feet. The material so raised is discharged into barges alongside, and by them taken to the site of deposit. Another is the Dolphin, also screw propelled, and engaged principally in dredging coral at one of the West Indian ports. It is so constructed that the buckets can project in advance of the hull and thus dredge in advance. The exhibitors are the inventors of a type of dredge known as the "hopper," and within the past ten years have built over 50 of them for different parts of the globe. The "hopper" dredge, to be represented by a model has a capacity to contain 800 tons of mud, and the buckets are of a capacity equal to raising 1,000 tons an hour, and from a depth of 35 feet. The iron framing on which the upper end of the bucket ladder rests is of such construction that the ladder and buckets can be traveled a considerable distance forward, and allow of the ladder being lifted clear of the water.

The exhibit of the Bethlehem Iron Company, of South Bethlehem, Pa., will weigh about 1,000,000 pounds and will contain, in addition to armor, guns and gun forgings and ingots, a number of shaftings that will prove interesting. The shafting exhibit required the most skill to manufacture, and consists of a finished crank for the Pacific Mail Steamship Company's City of Sydney, a finished crank for the United States cruiser Minneapolis, a spare shaft for the Colony Steamboat Company and an unfinished hollow-forged shaft 66 feet, 11 inches long. This last is the most remarkable piece of forging on record, and was made especially to show the skill of the forgers at the Bethlehem ordnance works. A model, full size, of a 125-ton steam hammer, the largest in the world, will also be a feature in this company's exhibit.

Models of steamships used in connection with the Canadian Pacific Railway are being installed in the transportation building.

Appointment of Steamboat Inspectors.

As a result of the change in administration at Washington, it is evident that, in addition to certain changes in local boards of inspectors of steam vessels, the two supervising inspectors in charge of the lake districts, Messrs. McMasters and Westcott, located at Buffalo and Detroit, respectively, will be removed and there will be a big scramble to succeed them. The number of candidates for the Buffalo position is large and the contest there will be very spirited, but most interest will be attached to the question of a successor to Capt. C. H. Westcott of Detroit, as an effort is again being made to have the office removed to Chicago. Last week it was shown that J. H. Galwey of Detroit, an engineer who is a candidate in the Detroit district, had about ruined his chances for success by incurring opposition from the vessel owners, through a letter making promises of allegiance to the association of engineers, and now it is announced that Capt. Cyrus H. Sinclair, an opposing candidate, has sought and secured endorsement from the Chicago branch of the Ship Masters' Association. Sec. 4416 revised statutes of the United States says that "no person who is a member of any association of owners, masters, engineers or pilots of steamboats shall be eligible to hold the office of either supervising or local inspector." Laws and regulations of this kind do not seem to amount to a great deal in appointments to office in the steamboat inspection service as at present constituted, and, of course, either of the candidates here mentioned might readily resign their membership in such organizations, as has often been done before, but it would seem that Capt. Sinclair, as well as Mr. Galwey, is treading on dangerous ground in raising a new issue by endorsement from the masters. Another section of the revised statutes, No. 4404, says that a supervising inspector shall be selected "for his knowledge, skill and practical experience in the uses of steam for navigation, etc.," which would seem to indicace that none but engineers can hold the office of supervising inspector, but we have knowledge of a case where a doctor held the position, and if this interpretation of the law is correct, several such officers now in service could be removed through the courts. But there seems to be no good in talking of laws and their application to this service. When will this important branch of the treasury department be removed from politics?

High Prices and a Big Business in Lumber.

Reports from lumber districts in all parts of the lakes are to the effect that old stocks are entirely cleaned up and that prices do not seem to enter into calculations in the demand for the new season's output. A late summary of the Saginaw market says: "The lumber manufacturing season opens in eastern Michigan this spring under more favorable auspices than at any corresponding period in the history of lumbering or at least in 30 years. In comparison with the magnitude of the industry at no time have there been such small stocks in manufacturers' hands, never before have there been such extensive sales of stocks to be cut, and prices have never been more satisfactory. At the close of the manufacturing season of 1891 there was on the mill docks of the Saginaw river alone 342,000,000 feet of lumber, of which 240,000,000 feet was unsold. The product of the mills in 1892 was 708,000,000 feet, and there was on hand at the close of the season 235,000,000 feet, or about 100,000,000 feet less than at the same date the previous year, while the quantity unsold in the beginning of the present year scarcely reached 100,000,000 feet. This has been nearly all sold during the winter, and it is the general complaint among buyers that there is no lumber to be bought on the cargo market on the river, except of two or three mills cutting green stock. Not only this but more than 100,000,000 feet has been sold for future delivery, the logs from which it is to be manufactured not having yet reached the mills. Prices which were firm all last season have steadily advanced, and pine lumber is selling today at an average of fully $3 a thousand higher than when the mills shut down last season, with a corresponding advance in yard stocks. Under these conditions a decided impetus has been given to operators during the winter and manufacturers have manifested much energy in securing a full stock for their mills which are to be put in motion at the earliest practicable moment. A dozen mills are in operation on this river and others will go into commission this week. A few mills will not start until the boom company begins delivering logs."

Iron Mining.

VALUE OF LEADING STOCKS.

Quoted by Chas. H. Potter & Co., No. 104 Superior St. Cleveland, O.

Stocks.	Par Value.	Bid.	Asked.
Cleveland-Cliffs Iron Company	$100 00	$ 55 00	$.....
Champion Iron Company	25 00	27 00	.....
Chandler Iron Company	25 00	.....	40 00
Jackson Iron Company	25 00	.....	75 00
Lake Superior Iron Company	25 00	31 00	.....
Minnesota Iron Company	100 00	.....	64 50
Pittsburgh & Lake Angeline Iron Co	25 00	.....	137 50
Republic Iron Company	25 00	.....	9 75
Ashland	25 00	.....	.....
Section Thirty-three	25 00	1 00	.....
Brotherton	25 00	2 00	2 50
Iron Belt	25 00	2 40	2 75
Aurora	25 00	6 50	7 00

There is now no doubt of the Michigan mining exhibit being among the most interesting collections in the mines and mining building at the World's Columbian Exposition. The Calumet and Hecla company is preparing, in addition to numerous specimens, models showing the main features of its great copper plant. Drawings of the Minnesota mine and models of the Chandler and two of the mines of the Cleveland-Cliffs company will be among the leading features in the iron mining exhibit. Samples sent from the Lake Angeline, one of the richest of the Michigan properties, show over 69 per cent. metallic iron and .008 phosphorus, and such ore could be supplied for the market if it was wanted.

The Standard Ore Company, now operating the Cincinnati mine, Mesabi range, on a sub-lease from the Cincinnati Iron Company, wants its royalty reduced to 40 cents a ton. The fee owners, who are paid by the Cincinnati company 30 cents on one forty and 25 cents on six forties, have agreed to a reduction of 5 cents in each case, in order to bring about a reduction from the lessees to the company operating the property. The mine has not turned out as expected. The ore has shown only 58 per cent. metallic iron while 62 per cent. was expected of it, and a strip 90 feet wide, on which were several of the best pits, turned out to be on the Biwabik property when a re-survey was made.

When the Cleveland and Cliffs mining companies were consolidated some time ago under the laws of West Virginia, it was understood that Michigan laws presented obstacles in the way of consolidation, and that the failure to conciliate the interests in the Cliffs company held by the Tilden estate of New York and the Ogden estate of Chicago, had resulted in considerable annoyance to the new corporation. An effort is again being made in the Michigan legislature to so amend the mining laws as to overcome in part the difficulties that have arisen in the matter.

The Champion Mining Company is the latest to order machines for crushing its ore. This company has a large quantity of hard ore in stock and the machines will be applied to preparing it for market.

D. M. Philbin, formerly superintendent of the Duluth, South Shore & Atlantic Railway, has been appointed general manager of the new Duluth, Missabe & Northern.

Personal Mention.

Mr. C. B. Calder, engineer surveyor for the Bureau Veritas, has inspected the machinery of the new steel steamer Yuma, which will be classed by the French association.

Marshall D. Wilber of the Chicago Yacht Club writes us that the harbor committee of the club will meet this week, and that there is every reason to expect that the exposition management will provide adequate shelter for all classes of yachts.

Mr. W. A. Todd, superintendent of the Columbus, Hocking Valley & Toledo Railway Company's docks at Toledo, says that iron ore on the docks of which he has charge is about cleaned and that the company expects to do a very large lake business during the season now opening.

Messrs. C. T., H. T. and M. H. Morley, ship builders and ship owners of Marine City, V. K. Moore of the Iron Star Company of Detroit, and E. Platt Stratton of the American Ship Masters' Association of New York, were all in Cleveland during the week attending to matters of business.

Ship Yard Notes.

About 1,300 men are employed in the different departments of the plant of F. W. Wheeler & Co. at West Bay City, and following the launching, this week, of the big steel steamer for the Hawgood & Avery Transit Company there will be a succession of launches from the the two big yards in this busy center of shipbuilding. Capt. James Davidson has closed another contract for a schooner, to have a capacity for 55,000 bushels of wheat. The boat will be for the Ketchum Lumber Company of Chicago and will cost about $38,000.

William Loutit of Grand Haven has let a contract with the Grand Haven Ship Building Company for a steamer, to be 200 feet long, 25 feet beam and 13 feet hold. The engines, to be built by the Frontier Iron Works of Detroit, will be compound, 22 and 44 by 38 inches stroke. Johnston Bros. of Ferrysburg, Mich., will build the boiler, which will be of the Scotch type, 13 by 13 feet.

At the Wyandotte yard of the Detroit Dry Dock Company, the new side-wheel passenger steamer City of Mackinac, building for the Detroit and Cleveland Steam Navigation Company will probably be launched during the present week. Work is being pushed on the City of Alpena, the other new boat, but it is hardly probable that she will be ready for service in June.

The passenger steamer City of Holland, recently launched at Holland, Mich., is being engined by the Montague Iron Works of Montague, Mich. She is 156 feet long and 29 feet beam and will carry 250 passengers, running in connection with the steamer Saugatuck between Holland and Chicago.

The Lake Erie Transportation Company's boat, building at the yard of the Union Dry Dock Company, Buffalo, is all in frame and about half plated. It will not take long to push her to completion when the rush of repair work at the yard is at an end.

Simon Langell of St. Clair, Mich., will lay a keel for a vessel shortly, but has not as yet decided whether he will build a steamer or a consort for one of the steamers of his fleet.

Opening Dates.

As a matter of record some notes are made here regarding the early movement of vessels in the general freighting business of the lakes. The first vessel to leave Chicago for Buffalo was the steamer C. B. Lockwood, and the first vessel to pass through the straits was the Philip D. Armour, at 7 a. m. April 17, followed closely by the Egan, City of Paris, Onoko, Lockwood, Plankinton, Fryer, Elphicke and Fitzgerald. The Lockwood was the first to pass Port Huron and the first to reach Buffalo at 10 a. m. on the 19th. The Cleveland Rolling Mill Company's steamer Samuel Mitchell, Capt. Thomas Wilford, was the first vessel to leave a Lake Erie port for Lake Michigan, first to pass the straits at noon April 17 and first to reach Chicago at 6 a. m. on the 19th.

In General.

A maximum speed of 23.5 knots, equal to 27 miles, is reported to have been attained by the big Cunard liner Campania, during her trial trip on the Clyde. She is scheduled to leave Liverpool for New York on Saturday next.

Trinity Bay, 16 miles northeast of Galveston, is said to be the Gulf site looked upon most favorably by the officers of the American Steel Barge Company for the establishment of a ship yard. Stockholders of the company have land interests at this point.

On the 27th inst., the executive committee of the National Board of Steam Navigation, made up largely of owners of Mississippi and Ohio river steamers, will hold a meeting in New York to make recommendations to the supervising inspectors of steam vessels regarding the law of April 3, 1892, governing lights for barges and canal boats when in tow of steam vessels. The inspectors will meet on May 10 to consider this law, which has a special bearing on river navigation.

In accordance with a circular order issued recently by S. I. Kimball, general superintendent of the life saving service, keepers of life saving stations will hereafter transmit by telegraph to the Washington office of the service a report of every wreck or marine casualty occurring within the limits of their respective stations, as soon as it can be done without interfering with the work of saving life and property. In cases where loss of life occurs the messages will not only give the number of persons lost but also brief particulars of the loss.

MARINE REVIEW.

DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.

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ONLY a few years ago the average citizen of New York and other eastern places was disposed to look upon lake commerce and ship building industry here as matters of little more importance than the inland river and canal business of the country. Statements of the growth of shipping on the lakes were accepted with mistrust, and in many cases with derision, but the facts as to this commerce have been presented in a most convincing manner through the newspapers, through the work of the Lake Carriers' Association in Washington and through government reports. Both the Herald and Tribune of New York contained during the past week extensive articles on the development of this commerce, and there are few of the magazines or commercial journals of the country that have not recently dealt with the subject at great length. In its issue of Wednesday last the New York Tribune says in concluding an editorial showing that one-third of the tonnage of the United States is owned on the lakes, and that the average lake steamer is larger than the average ocean steamer owned in this country: "The probable future of the commerce of the great lakes it would be hazardous to forecast. Enthusiasts are confident that it will ultimately force a passage to the sea by a deep water canal. There are so many marvels in American material progress that it is hardly prudent for any cautious observer to say that some new miracle may not happen. But one thing it is safe to assume, and that is that Canadian shipping never can be able to compete with American commerce on the lakes. So long as Canadian shipping is excluded from the coasting trade on the American side it will languish from lack of business. Its growth is insignificant in comparison with that of the American fleet, and there is hardly business enough to keep it alive. The lack of flexibility in Canadian commerce corresponds with the slow growth and laborious progress of Toronto and other towns on that side of the line. The great province of Ontario, lying between Michigan and New York and most favorably situated for the development of industrial interests of the first magnitude, does not and can not compete with the adjacent American states nor have any appreciable share in their prosperity. The Canadians know why this is so. It is because they are not in the political system where nature designed them to be."

WHATEVER the condition of the iron market may be as regards prices, it will be well for the vessel owner, who is confronted with the opening of navigation and no contracts for the transportation of iron ore, to bear in mind the fact that the furnaces of this country are making more pig iron than ever before; that the weekly production during March was 5,000 tons in excess of February, and that there is reasonable assurance of this activity continuing throughout the greater part of the year. In addition to the certainty of a big business in grain, coal and lumber, there is also the assurance that the iron ore movement to Lake Erie ports must be large, notwithstanding the present conditions bearing upon the question of freights.

RECENT decisions of the United States supreme court in the cases of the city of Chicago against the Illinois Central Railroad not only give the lake front to the city, but establish the principle that a state can not give away the riparian rights of the people. The state can give a railroad an easement over water property, but it can not transfer the ownership of the right of way. The finding of court is important to all lake cities, as there is scarcely a town of any size that will not be compelled to deal sooner or later with the question that has demanded so much attention in Chicago.

NOW IT IS the people of St. Paul and Minneapolis who are stricken with the canal fever. Articles of incorporation have been filed with the secretary of the state of Minnesota by the Minnesota Canal Company, the promoters fixing their capital at $2,000,000 and announcihg that they "will begin the construction of a canal between St. Paul and Duluth at an early date—possibly by midsummer." This is another canal without an ending place, purely local in its nature, and, of course, entirely on paper. Its cost, when compared with all returns that might possibly be made for the outlay, would be far beyond the dreams of its most enthusiastic projectors.

VESSELS now entered in the Lake Carriers' Association have an aggregate tonnage of about 575,000 tons. The membership this year will, before the books are closed, show a considerable increase over last year, and as nearly all of the private light expense of previous seasons will now be borne by the government, the association will make a good showing in 1893 from a financial standpoint, as well as in the steady increase in benefits derived by the entire lake marine.

Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store at the principal points of accumulation on the lakes on April 15, 1893:

	Wheat, bu.	Corn, bu.
Chicago	17,346,000	5,004,000
Duluth	16,841,000	341,000
Milwaukee	2,018,000	12,000
Detroit	2,014,000	33,000
Toledo	3,741,000	1,566,000
Buffalo	1,785,000	133,000
Total	43,745,000	7,089,000

At the points named there is a net increase for the week of 670,000 bushels of wheat and a decrease of 697,000 bushels of corn.

In addition to the above stocks, there was afloat in lake vessels at Chicago on the 1st inst. 4,418,000 bushels of wheat, 2,572,000 bushels of corn and 383,000 bushels of oats; at Duluth, 571,000 bushels of wheat; at Detroit, 396,000 bushels of wheat, and at Toledo 310,000 bushels of corn.

Capt. Alex. McDougall's Patents.*

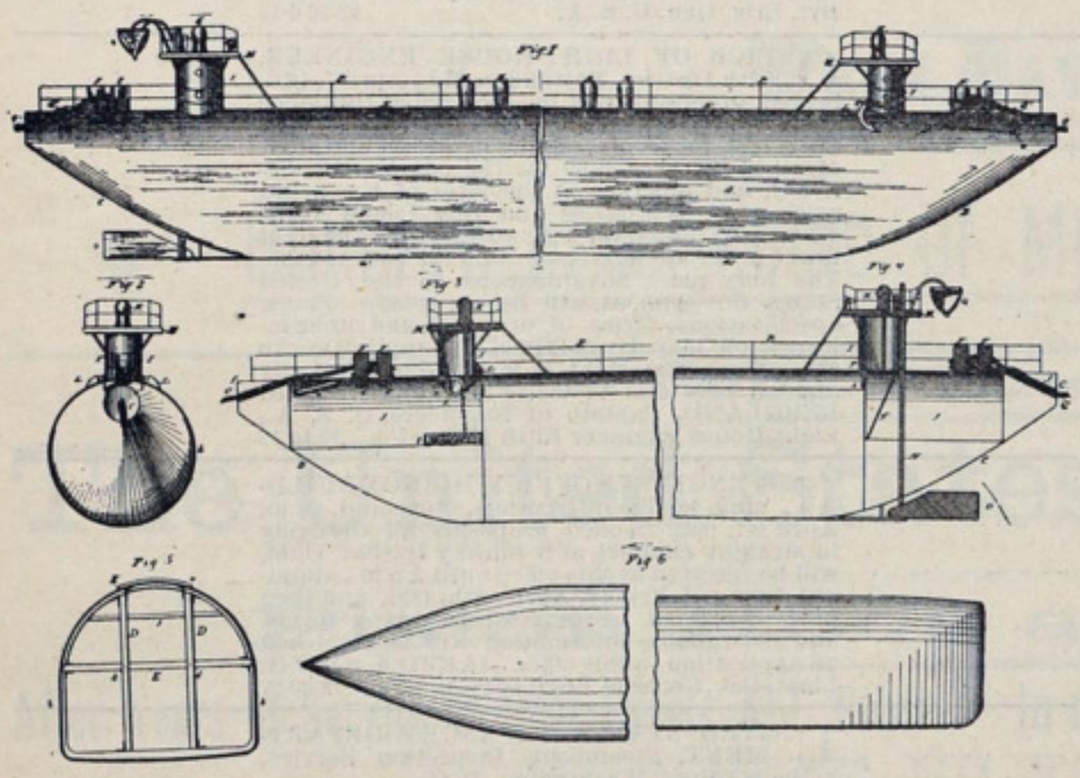
TOW BOAT—SPECIFICATION FORMING PART OF LETTERS PATENT NO. 259,889, DATED JUNE 20, 1882—APPLICATION FILED APRIL 4, 1882—NO MODEL.

In this second specification filed with the patent office Capt. McDougall describes a wooden tow barge of the type in use on the lakes, and refers to the masts, spars, sails, high bulwarks and ship style of bows and sterns as expensive and unnecessary. "My invention," he says, "proposes to obviate these disadvantages by making the tow boat of iron or steel instead of wood, by dispensing entirely with masts, spars, sails and bulwarks, and by adopting a form of hull best suited to be towed easily in all sorts of weather and to make the least deviation from the line of towage. The construction required to secure these advantages constitutes the invention which is the subject of this application. It consists, first, in the shape of the hull; second, in placing decks elevated on turrets above the hull proper for the guidance and management of the vessel; third, in the construction of the

*Under this heading we will publish specifications accompanying letters patent granted to Alexander McDougall since his first application for a patent on the whaleback type of vessel in March, 1880.

hull; and fourth, in various details of construction, all hereinafter to be more fully described.

"Figure 1 is a side elevation broken out in the center; Fig. 2, an end elevation; Fig. 3, a central vertical section of the bow; Fig. 4, a similar section of the stern; Fig. 5, a vertical cross section of the hull, and Fig. 6, two views showing a modification of the bow and stern. Like letters represent the same parts in all the figures. In the drawings, A represents the hull, which is preferably in extreme length about ten times the breadth of the beam, and the depth of the hull is about four-fifths of the breadth of beam—that is to say, in a tow boat 200 feet long I prefer to have the same about 20 feet wide and 16 feet deep. The frames which constitute the ribs are precisely similar in size and shape throughout about three-fourths of the entire length of the hull. In this extent of the hull vertical sections would show a bottom, *a*, nearly flat, or preferably with a rise to the floor timbers of not over a half-inch to the foot. From this bottom the sides *b*, with a slight curvature at the point where they meet the bottom, rise in substantially vertical lines to a point about half the depth of the hull. Above this the top sides, *b'*, rise preferably in a true semi-cylindrical form. Thus the lower half of the hull has substantially vertical sides and a flat horizontal bottom, and the upper half a semi-cylindrical form with a top in the same horizontal plane. By reason of this particular form of the lower half of the hull there are obtained the greatest degree of buoyancy and the largest capacity for carrying weight with a given depth of submersion, and at the same time the most convenient form for the storage of cargo, while the upper half, from its arch-like form, gives the greatest possible power of support to the remainder of the hull, with the least weight of metal. In the con-



struction of this portion of the hull described I propose to use ribs, keelsons, covering plates, etc., in ways now well known in building iron vessels.

"The bow B and stern C are built and shaped alike, tapering in regularly outwardly curving lines at the sides and from the bottom upward, so that vertical sections of the bow and stern at a little distance from the hull proper assume forms nearly cylindrical. Both the bow and stern, at their upper parts, are nearly horizontal and in line with the line of the upper part of the hull, and the extreme ends, *c c'*, of the bow and stern are preferably flat or bluntly rounded. This exterior tubular form of the hull, it will be seen, permits the vessel to be submerged to a great depth, as there are no openings for water to enter, and at the same time offers little resistance to the air or winds. It permits a great cheapness of construction, as it employs similar frames throughout the body of the hull and the corresponding frames at the bow and stern are precisely alike. It avoids the difficult and expensive system of a great number of dissimilar frames as ordinarily used, and particularly those in connection with the stem and stern post, which from their form make it difficult and expensive to bend and secure the covering plates. By my plan the covering plates would have to be bent very slightly at any point, and could be bent cold. From the rounded form of the bows, without a stem, I have demonstrated by experiment that there is the least tendency to deviate while the vessel is under towage, whether the sea be heavy or otherwise, and this tendency to follow exactly the line of strain is increased by the fact that the tow line is made fast to the central extremity of the vessel.

"The interior of the hull is strengthened by stanchions D and cross beams E, preferably to every second frame, as usual, secured at their respective ends to angle irons and arranged so as to come in contact, and then secured together, as shown at *d d*. I prefer to place a deck about four feet below the center horizontally of the top of the hull, extending from the bulk head of the cabin to that of the forecastle (shown by Figs. 3 and 4 in the drawings), and having access both to the cabin and the forecastle by means of proper man-holes with water tight covers (marked 2 2 in the drawings), and to have the hold below this deck unobstructed except by the beams and stanchions. The purpose of this deck will be to give a covered passage way in extremely severe storms between the cabin and forecastle, and also to prevent the cargo, under any stress of weather, from shifting, and also in some degree to have a chamber nearly air tight in the extreme upper part of the hull, the better to preserve the equilibrium of the same under all conditions. Upon the top, or what corresponds to the deck, are several hatchways, E' E', capable of being closed water-tight in any well-known way. When the hatchways occur I prefer to use the dependent sides of the hatch-combing *e* as an angle iron, to which the upper ends of stanchions are secured.

"Near the bow of the vessel is a turret, I, which rises above the deck a sufficient distance to be above the reach of the waves, preferably about eight feet for lake navigation. This turret is an iron cylinder of a size sufficient to permit of a stairway, *g*, down to the deck of the forecastle, J, and also to permit of a capstan, K, which may operate a suitable windlass. In this forecastle are placed suitable chain boxes or other convenient receptacles for the chain cables, which lead up through the deck to the anchors L, L, which are secured upon the deck. Upon the top of the turret is placed a suitable deck, M, protected by railings. At the stern of the boat is a similar, but preferably a little larger, turret, I, having a stair case, *g'*, leading down to the floor of cabin J', and a capstan, K', and a deck, M', upon its top, with suitable railing, having a steering wheel operating a rudder post, N, which in turn operates the rudder O. This forecastle J, as well as the cabin J', is placed in the upper portion of the hull, preferably near the bow or stern, and is protected on all sides from the entrance of water, thereby, in case of leakage in the hull, acting not only to prevent the vessel from sinking, but to preserve its proper vertical position. Suitable railings, P P, inclose a central walk along the deck of the vessel from end to end, in which are placed ladders, which give access to the tops of the turrets. From the deck M' a small boat, Q, may be conveniently hung by davits. The hull of the vessel is provided with water-tight bulk heads near the tow posts, and preferably between them and the extreme ends, *c c'*, of the vessel, and other bulk heads may be used in other portions of the hull, as desired. I have described two turrets, which I prefer for convenience, but it is evident that a greater or less number could be used, or they could be placed in positions upon the deck different from those indicated, without departing from the spirit of my invention. In Fig. 5 is shown a modification of the bow and stern wherein the the sides of the vessel only are narrowed down, while the lines of the top and bottom are unchanged. This modification I do not prefer, but it may be employed to advantage under certain circumstances. What I claim as new in my invention is:

"1. A tow boat having a flat bottom and vertical sides, except at the ends, a semi-cylindrical uppor portion throughout its entire length, and having the bottom and sides toward the ends tapering in outwardly curved lines to the extremities, so as to form a precisely similar conical bow and stern, substantially as described.

"2. A tow boat, substantially as described, having turrets rigidly secured to the same, each turret supporting a separate open working deck, upon which is placed and worked the steering and hauling-in gear, substantially as described.

"3. In a tow boat, substantially as described, in combination with the turrets, and communicating with them, a water-tight cabin and forecastle arranged on the upper part of the hull and communicating with each other by means of a passage way in the upper central portion of the hull and separated from the cargo space, substantially as described.

"4. The skeleton of a tow boat, substantially as described, consisting of numerous rib-frames, precisely alike in size and form, each with substantially flat lower parts and vertical sides and rounded tops throughout the body of the hull, bow and stern frames nearly annular and precisely alike in size and form at equal distances from the extreme ends, and cross beams and stanchions secured together at their points of contact, whereby a keel, keelson, and stem and stern post are dispensed with."

Notices to Mariners.

The light-house board gives notice that on the opening of navigation the light at Cheboygan light-station, on the main land opposite Bois Blanc island, will be changed from a fixed white light, varied by a white flash every 90 seconds, to a fixed white light, varied by a white flash every minute. The order of the light will not be changed.

The board gives notice also that on the opening of navigation the light at Fort Gratiot light station, head of St. Clair river, will be changed from a fixed white light, varied by a white flash every two minutes, to a fixed white light, varied by a white flash every minute. The order of the light will not be changed.

A new lighthouse has been built on Giant's Tomb Island, Georgian bay, and will be lighted in a few days. It will range with the Ginrock and Hope island lights, and show safe entrance to Midland harbor.

In passing Grosse point, vessels should keep to the westward of the lightship and should give her a berth of about 300 feet to find the best water.

Around the Lakes.

Wm. Ellis, superintendent of the Welland canal, writes from St. Catherines that the canal will open on the 21st inst., and that the draft of water when Lake Erie is not below its ordinary level is 14 feet. Lake Erie is not now below the ordinary level.

The steamer Onoko, Capt. Gerlach, has just arrived at Buffalo with 167,800 bushels of oats. This big cargo surpasses a record made by the Onoko some time ago, but it is now claimed that the wooden steamer Ferdinand Schlesinger last season took out of Chicago 169,420 bushels of oats.

Capt. W. C. Richardson of H. J. Webb & Co., Cleveland, has decided to give the name H. A. Barr to the schooner building for his firm at West Bay City. The name is selected in honor of the popular ore dock superintendent at Escanaba. The boat is 222 feet keel, 35½ feet beam and 19 feet hold.

Underwriters seem to be upholding last year's tariff of rates on hull business, as agreed upon at the meeting in Chicago a short time ago. A very large part of the hull business of the season has been closed within the past week, and as far as can be learned the few cuts reported in rates have been confined to a division of the commissions of local agents.

Stock in the Cuyahoga Transit Company, organized in Cleveland last week, is controlled by the firm of Hawgood & Canfield, for whom F. W. Wheeler & Co. of West Bay City are building a wooden steamer 313 feet over all. She will be named L. R. Doty, in honor of the gentleman of that name who is an important factor in Ohio coal business.

Capt. F. B. Hackett of Amherstburg, whose tug International was burned last fall, has purchased for $10,000 the tug Home Rule from the Bank of Quebec, Thorold, Ont., and will again be in readiness this season to do wrecking in the vicinity of the Detroit river and Lake Erie. The Home Rule is 80 feet over all and has new and powerful machinery.

Sales of vessel property: Steamer City of London, James Davidson of West Bay City to Chas. A. Macdonald, J. S. Dunham, J. J. Rardon and others of the Chicago Steamship Company, $125,000; schooner Ida Keith (damaged by stranding last fall), W. G. Keith of Chicago to G. W. Lennon and others of Buffalo, $4,000; schooner Irish, S. B. Grummond of Detroit to Capt. Wm. Christie, $1,175; schooners Monticello and Montmorency, Mr. Jacobs and others of Marquette to Geo. W. and Frank King of Bay City.

In a letter from Buffalo, elsewhere in this issue, reference is made to the case of the Frontier Iron Works of Detroit against Riter Bros. of Buffalo, growing out of a refusal, on the part of the Frontier company, to accept boilers for the Wilson line propeller Sitka manufactured by the Buffalo concern. The trial resulted in a verdict favorable to the Buffalo works, as was feared when the plaintiffs submitted their case to a Buffalo jury.

On the next trip the steamer Aurora, now bound up the lakes without a consort, will use for towing purposes a steam towing machine, manufactured by the American Ship Windlass Company, Providence, R. I. This machine has been described several times in the REVIEW, but the first practical application of it on the lakes will attract considerable attention. Owing to the strain on the tow line being controlled by a drum, a wire rope tow line can be used. Full particulars of its working will be given as soon after its trial as possible.

UNITED STATES ENGINEER OFFICE, 34 West Congress Street, Detroit, Mich., March 18, 1893. Sealed proposals for turbine power plant for the 800-foot lock, St. Mary's Falls Canal, Mich., will be received at this office until 2 p.m. May 2, 1893, and then publicly opened. Specifications, blank forms, and all available information will be furnished on application to this office. O. M. POE, Colonel, Corps of Engineers, Bvt. Brig.-Gen. U. S. A. 23-30-6-13

OFFICE OF LIGHT-HOUSE ENGINEER, Fifth District, Baltimore, Md., April 7, 1893. Sealed proposals will be received at this office until 2 o'clock p.m. of Wednesday, the 17th day of May, 1893, for furnishing the materials and labor of all kinds necessary for the completion, delivery, and erection at the sites of the metal work of Cape Charles and Hog Island Light Towers, Virginia, for a fixed sum for each light tower or for an aggregate sum for both towers. The bids most advantageous to the United States Government will be accepted. Plans, specifications, forms of proposal, and other information may be obtained on application to this office. The right is reserved to reject any and all bids and to waive any defects. ERIC BERGLAND, Captain of Engineers, U. S. A., Light-House Engineer Fifth District. 13 to 12

U. S. ENGINEER OFFICE, HICKOX BUILDing, 185 Euclid Avenue, Cleveland, Ohio, April 1st, 1893. Sealed proposals for dredging in straight channel at Sandusky Harbor, Ohio, will be received at this office until 2 p m., standard time, of Friday, April 28th, 1893, and then publicly opened. Specifications, blank forms, and all available information will be furnished on application to this office. JARED A. SMITH, Lieut.-Col., Corps of Engineers, U. S. A. 13-20-27

UNITED STATES TREASURY DEPARTMENT, Steamboat Inspection Service, "The Maltby," Washington, D. C.

A Special Meeting of the Board of Supervising Inspectors will be held at Washington, D. C., on May 10th, 1893, to determine and prescribe the lights for "Barges and Canal Boats when in tow of steam-vessels," in accordance with the Act of Congress approved March 3d, 1893.

All persons interested are invited to present their views in writing to the Supervising Inspector-General, Steamboat Inspection Service, "The Maltby," Washington, D. C., also to appear before the Board in person when it meets if they desire to do so.

No other business will be transacted by the Board except that specially referred to in this advertisement. JAS. A. DUMONT, Supervising Inspector-General. 6-13-20-27-4

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SOLE AGENTS FOR

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AND MANUFACTURERS OF

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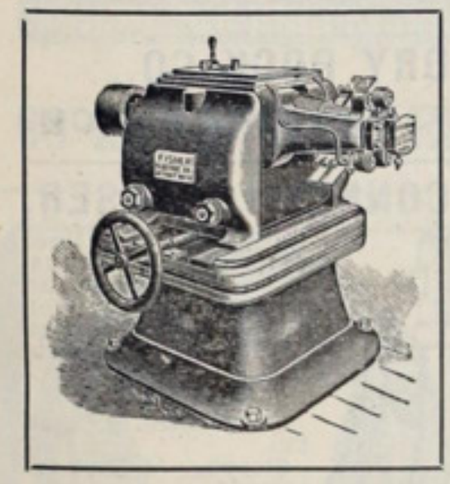

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MARINE REVIEW LINER EXCHANGE.

Space under this heading may be used gratis by our advertisers or subscribers to call attention to vessels or any craft, machinery, new or second hand, that they may have for sale. Those wanting machinery of any kind or wishing to purchase vessels, are invited to take advantage of the same offer. Employers in need of professional men or men who want positions may avail themselves of the opportunities offered. Each item will be limited to three lines. Letters concerning same must mention number attached to item and be addressed MARINE REVIEW, 516 Perry-Payne Building, Cleveland, O.

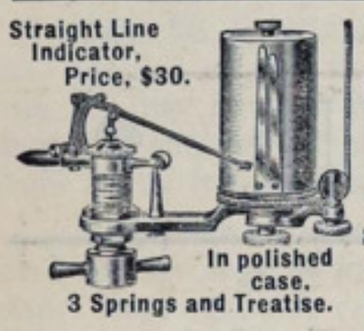
198—WANTED—To buy or charter 600-ton barge or schooner to carry ice.

199—Dredge engineer of eight years' experience on large dipper dredge and twenty years machine shop practice, first-class references, wants to change position.

200—FOR SALE—Dry dock, 315 feet long, 43 feet wide and 14 feet over all, at Bay City, Mich.

201—Three 3 to 5 ton derricks for sale cheap.

Straight Line Indicator, Price, $30.



In polished case. 3 Springs and Treatise.

STEP FORWARD AND OWN AN INDICATOR and know how to to use it. Send for circular.

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He is using the best till he has tried EUREKA PACKING For Steam, Water and Air. Send for Sample.

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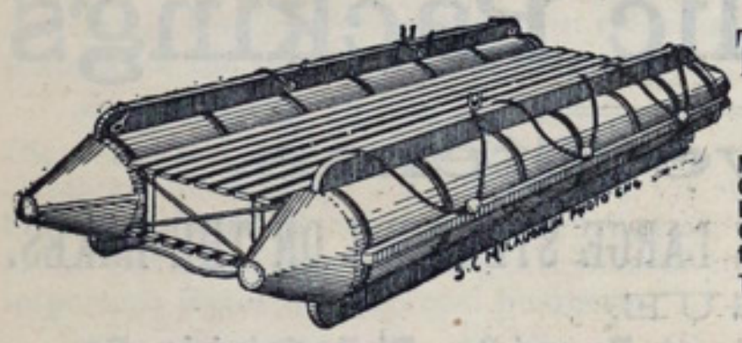

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AUTOMATIC
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A Simple, Power'ul Machine. Noiseless and Sure.
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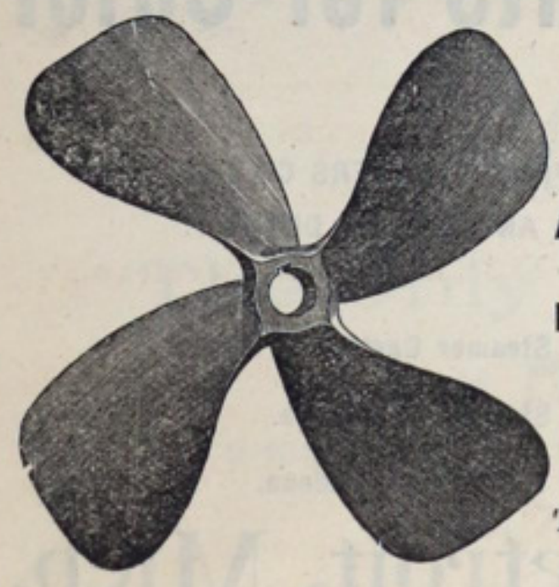

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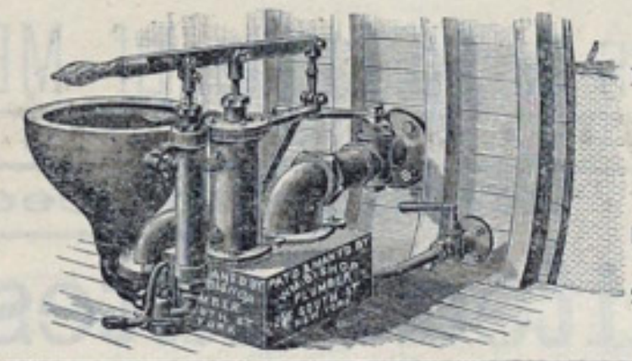

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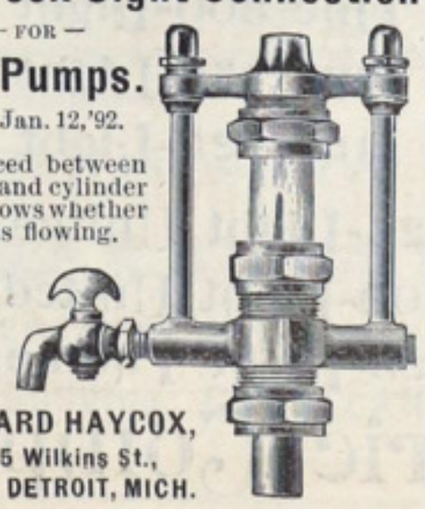

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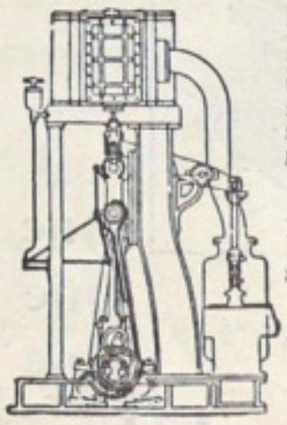

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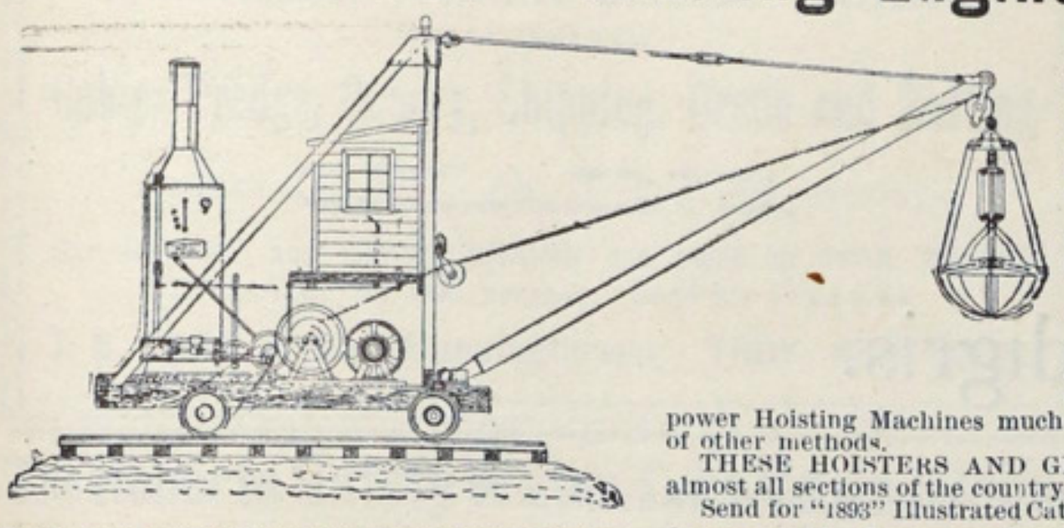

The Lancaster "1891" style of Hoister and Dredger.

THE LANCASTER "1893" HOISTING MACHINES and GRAPPLES are novel, require less power than others to operate, and are extremely efficient. They revolve the circle, are adjustably balanced, rise and lower the boom while lifting or lowering the Grapple, and dig or discharge ANYWHERE within the entire radial limits of the boom.

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These hoisters can be mounted on a truck, platform, deck or pontoon, or otherwise.

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THESE HOISTERS AND GRAPPLES are in use on all kinds of work in almost all sections of the country, and references will be furnished on demand.

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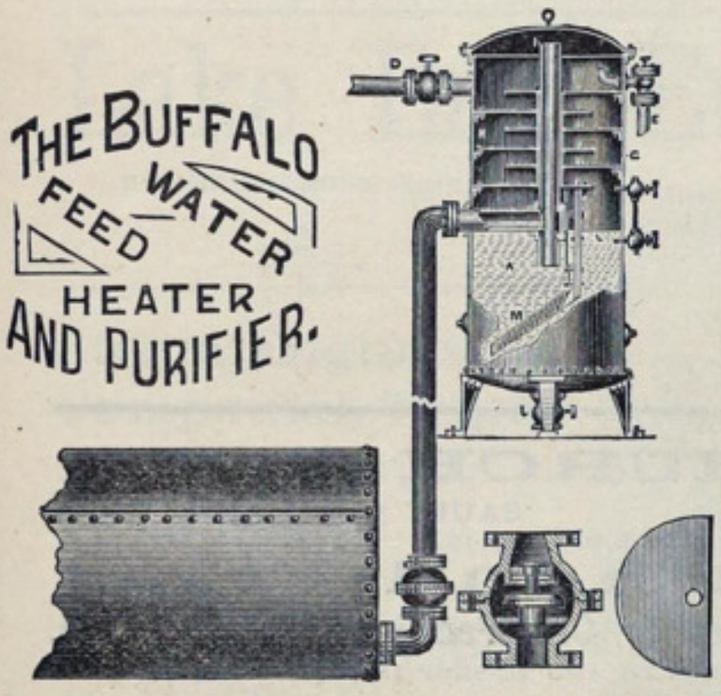

REFERENCES.

A.—Settling chamber.
B.—Boiler.
C.—Feed pipe to boil
D.—Steam pipe.
E.—Water supply pipe.
F.—Check valve.
G.—Spray disks.
H.—Spray chamber.
I.—Equalizing tube.
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K.—Automatic shut-off valve.
L.—Division plate.
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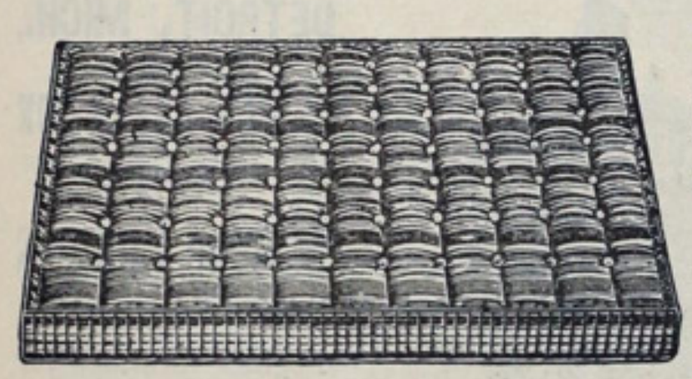

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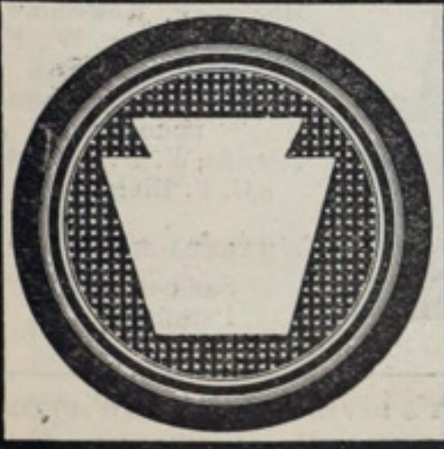

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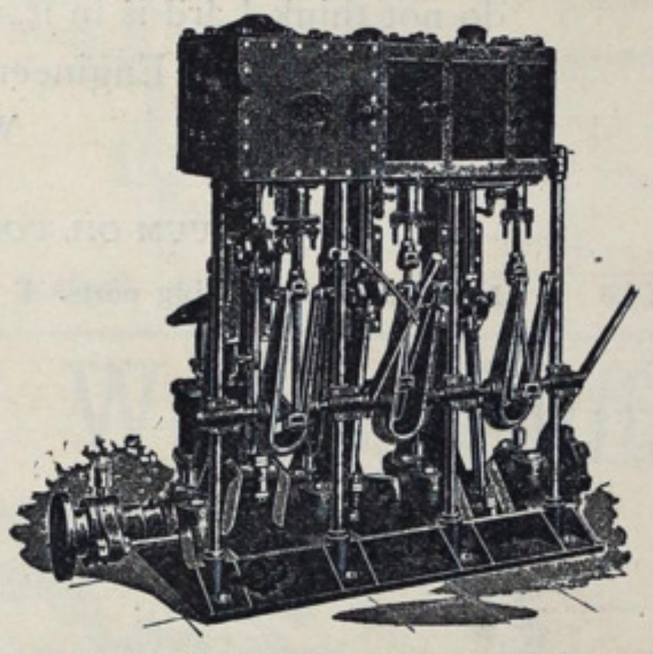

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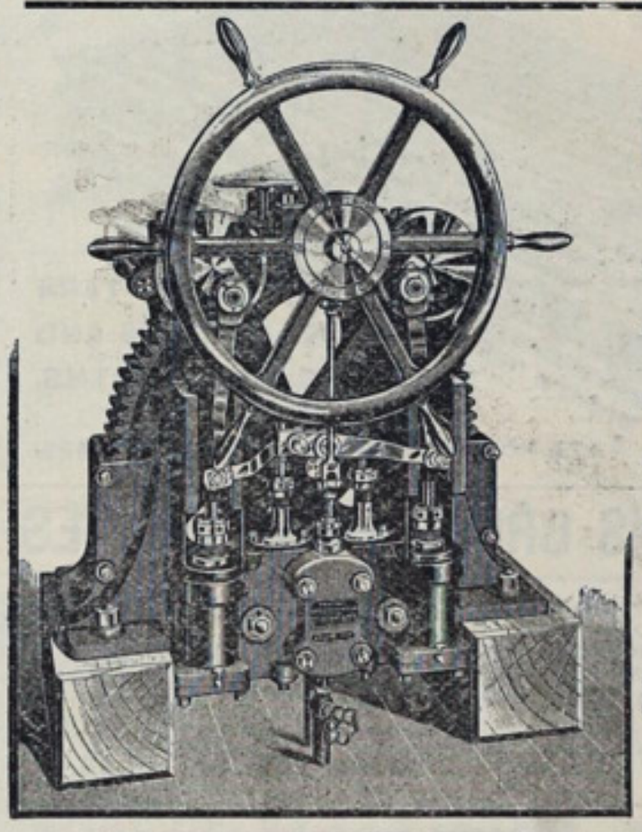

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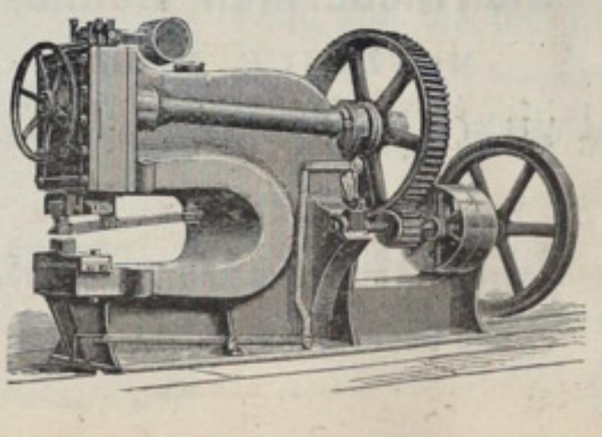

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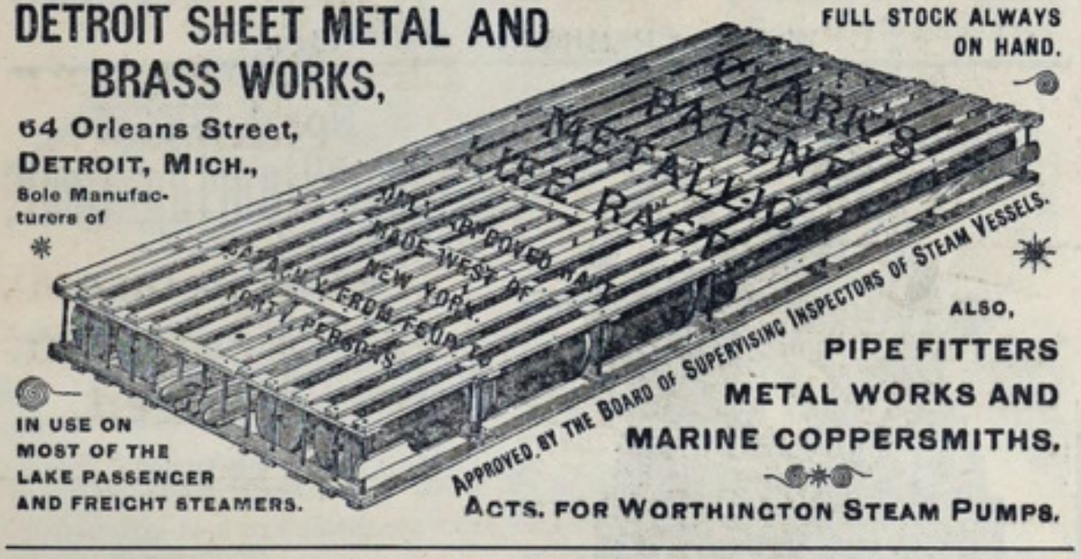

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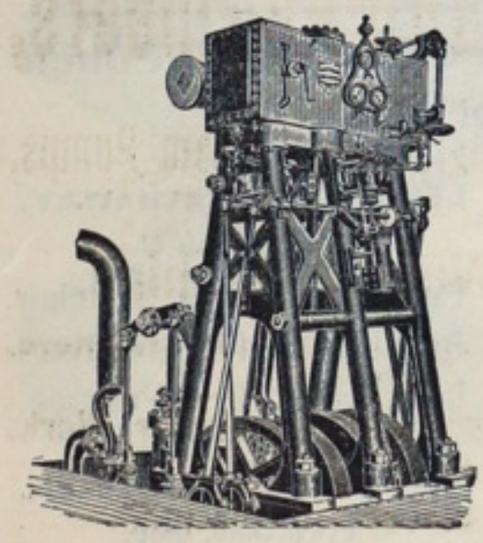

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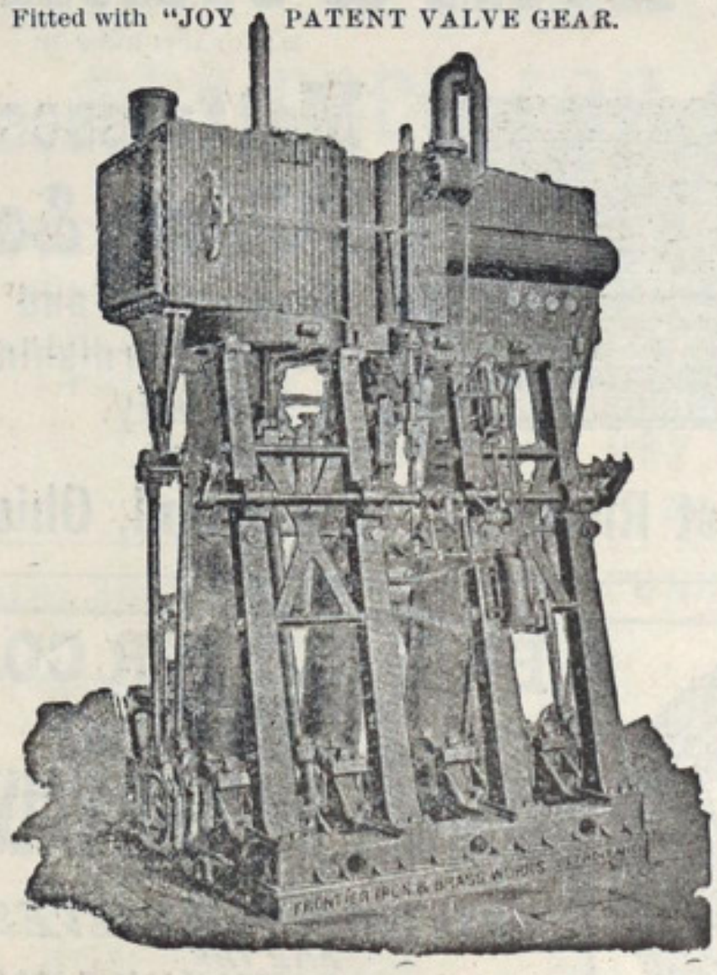

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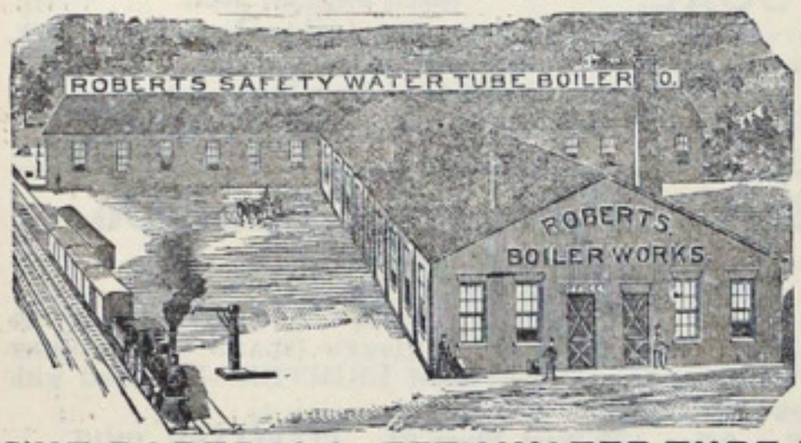

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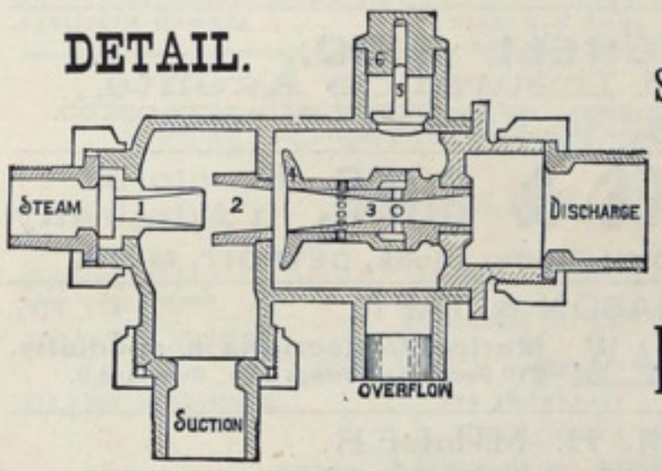

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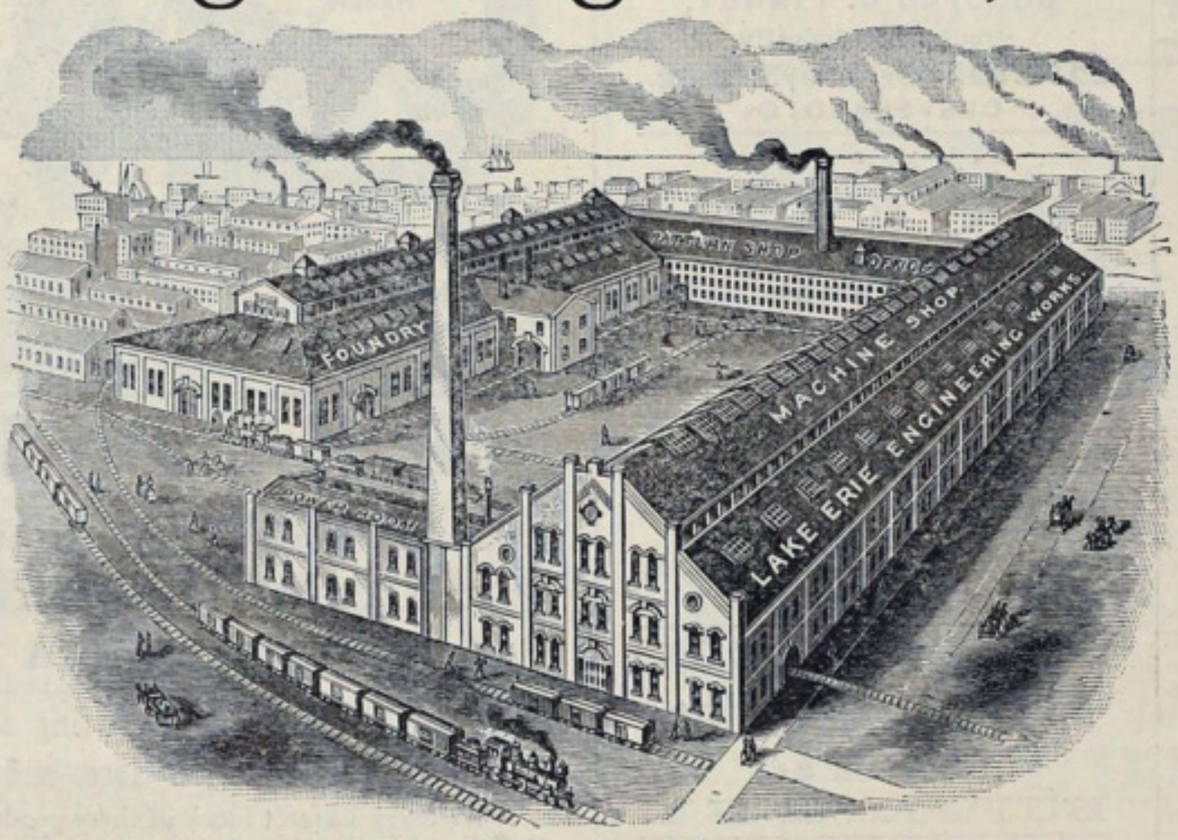

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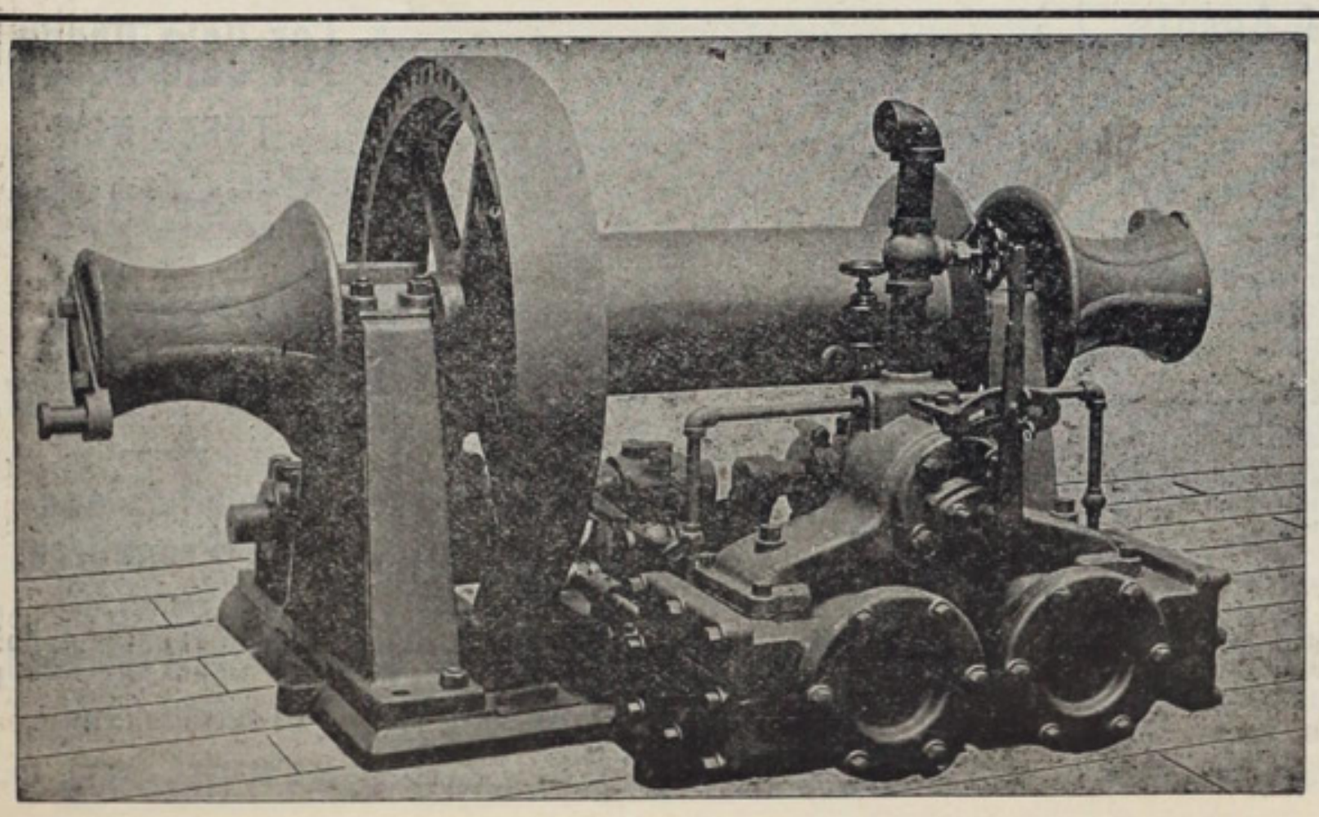

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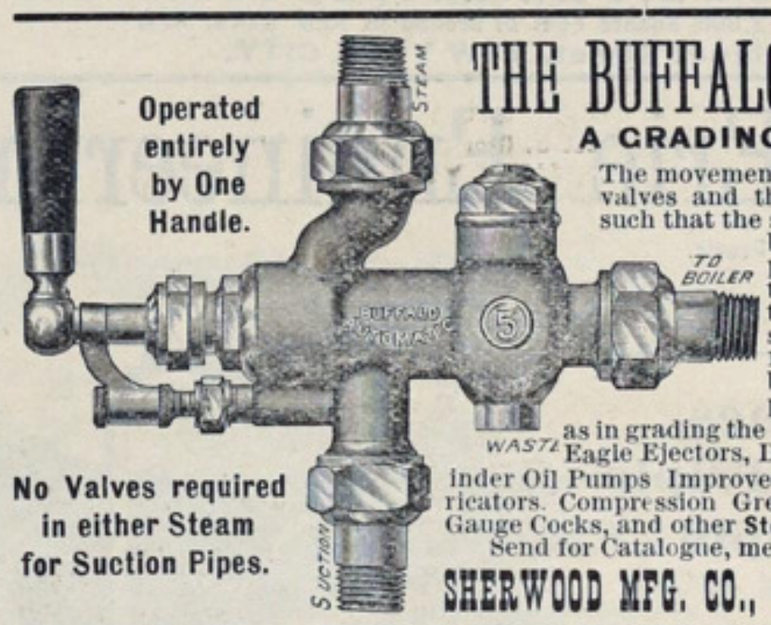

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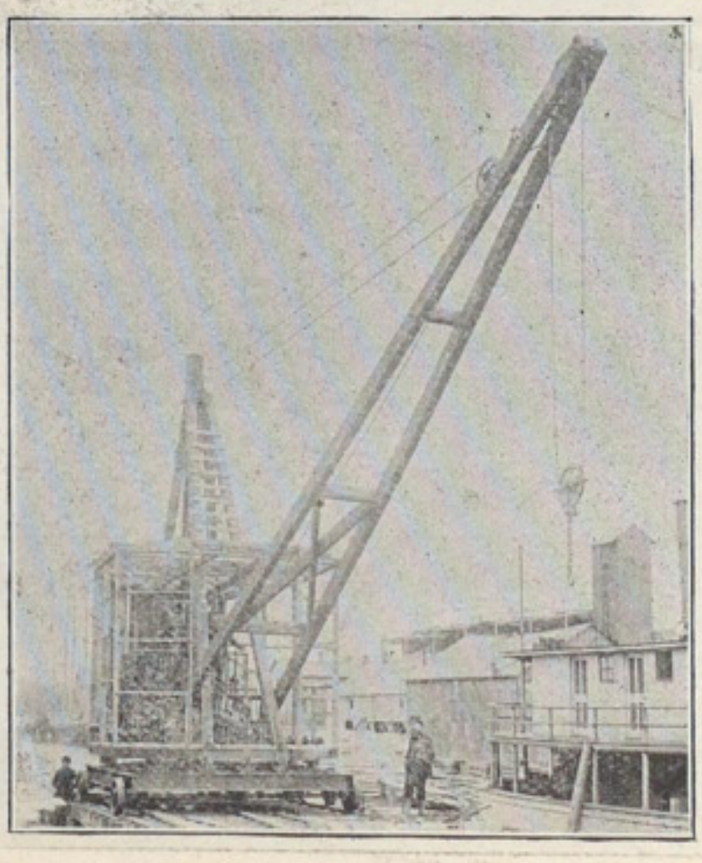

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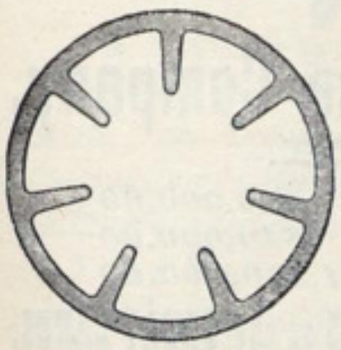

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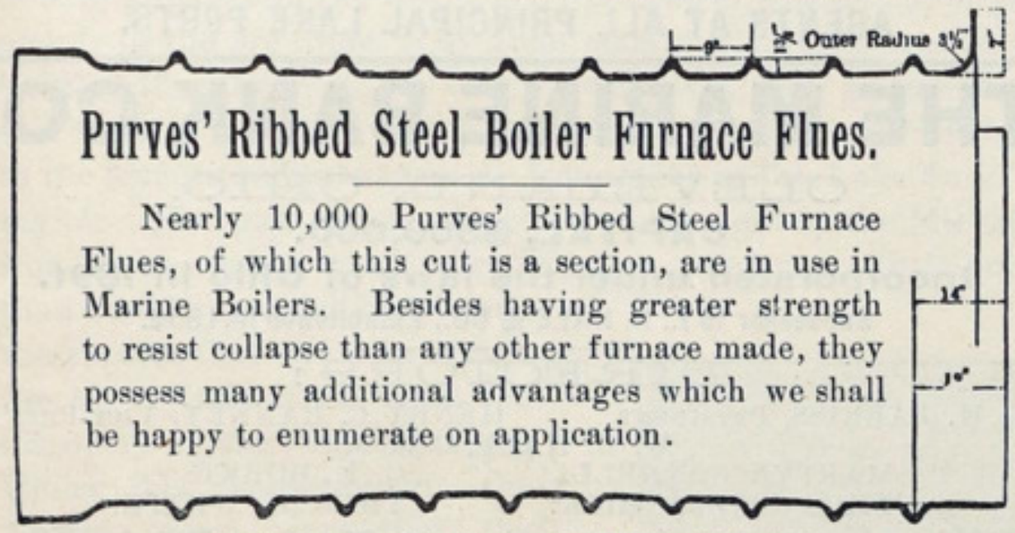

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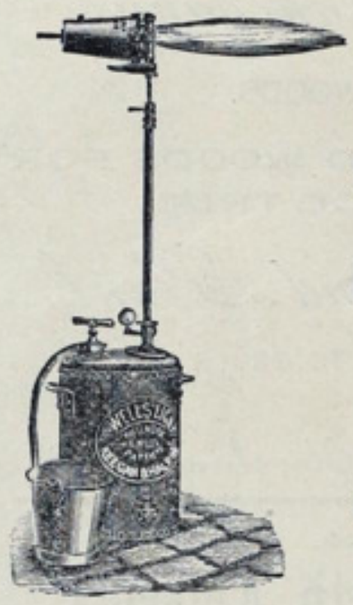

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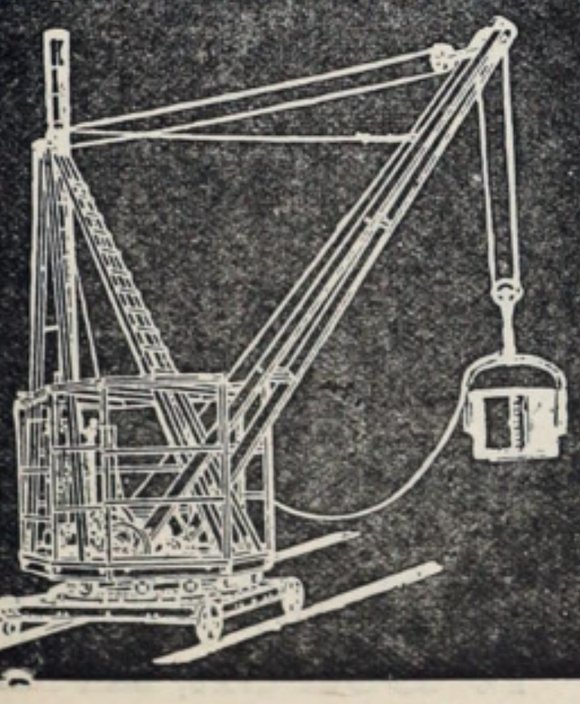

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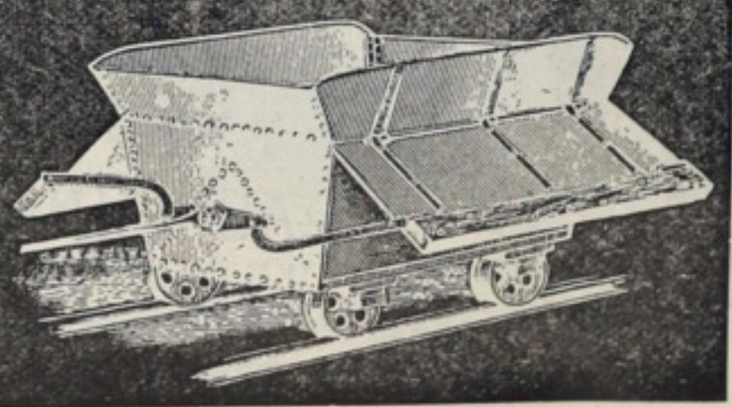

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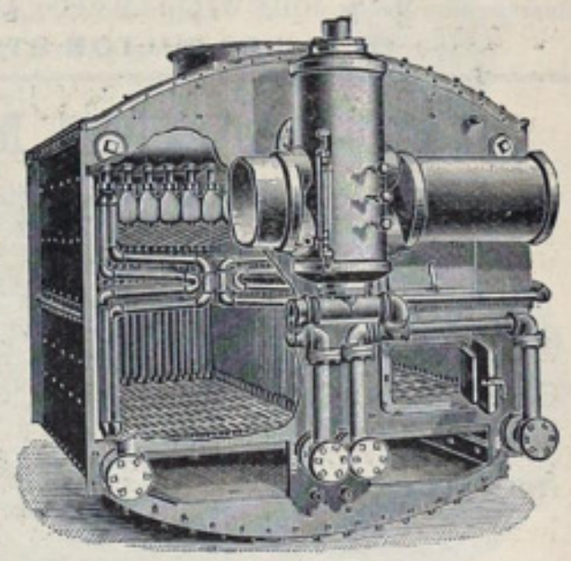

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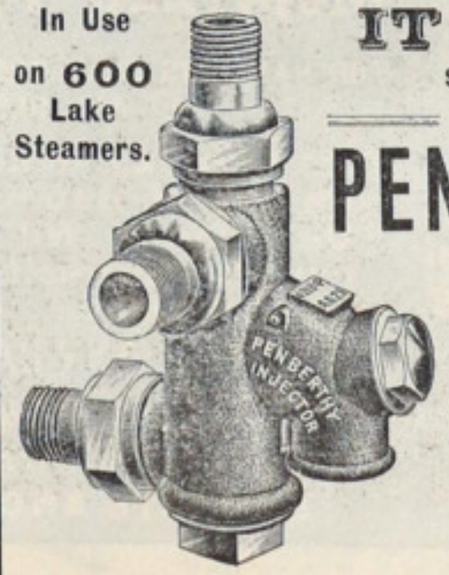

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